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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/646,343	09/18/2000	Sumi Tanaka	197310US2PCT	8744

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EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 09/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/646,343

Applicant(s)

TANAKA ET AL.

Examiner

Karla Moore

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/3/02.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 6, 8-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,383,971 to Selbrede and further in view of U.S. Patent No. 5,383,971 to Hayakawa et al.
3. Selbrede discloses a film deposition apparatus in Figures 1 and 2 comprising: a mounting table (17), a first heating apparatus (31), a first gas supply section (65,67), a movable clamp (29; column 5, rows 51-52)) and a second gas supply section (41).

In the invention of the Selbrede, the gas flow path extends so as to pass the edge portion of the target object (27) and is provided with a buffer section for controlling the conductance of the gas flow path (43). Selbrede further teaches the use of inert backside gas acting as a film-depositing prevention gas (column 1, rows 1-9) or as a heat transfer medium (column 2, rows 24-27).

The clamp of the invention is shaped like a ring and clamps the entire edge portion of the target object (column 6, rows 10-16) against an inner edge of a tapered surface.

However, Selbrede fails to disclose a second heating apparatus formed separately from the clamp with a gas flow path formed between the two structures or a control section for controlling a heating value of the second heating apparatus.

Hayakawa et al. disclose a film deposition apparatus in Figure 2, comprising: a second heating apparatus (17b) formed separately from the clamp (16a) and arranged opposite the clamp, for heating the clamp for the purpose of maintaining the substrate (8) and the vicinity thereof at a constant temperature (abstract). In the case of Hayakawa et al. the clamp and the heating apparatus are considered to be

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opposite one another because they lie on opposite sides of the a space bounded by the clamp, substrate and the mechanical clamp holder.

It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to have provided a second heating apparatus in Selbrede et al. in order to maintain the substrate and the vicinity thereof at a constant temperature as taught by Hayakawa et al.

Examiner notes that without insulation all structures in the vicinity of the substrate will be heated, either indirectly or directly, by all heating structures which are positioned in the vicinity. In Hayakawa et al. the vicinity of the substrate is viewed as all structures illustrated in Figure 2.

4. With respect to claim 8, which is drawn solely to processing gases for an intended operation, as mentioned above, it has been held that expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining the patentability of the apparatus claim. *Ex Parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969).

With respect to claim 10, Hayakawa et al. teach the use of a control section (a cooling water supply pipe, 19). Cooling water supply pipes are provided in the invention for the purpose of maintaining a constant temperature condition (column 3, rows 25-27 and column 4, rows 16-19).

5. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a control section in the prior art in order to maintain a constant temperature condition as taught by Hayakawa et al.

6. Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Selbrede and Hayakawa et al. as applied to claims 1-4, 6, 8-14 above, and further in view of U.S. Patent No. 5,705,223 to Bunkofske.

7. Selbrede and Hayakawa et al. disclose a film deposition apparatus as described above.

However, Selbrede and Hayakawa et al. fail to disclose a backside gas, which can be used as a cleaning gas.

Bunkofske teaches the use of a backside gas used as a cleaning gas for the purpose of removing edge coating formed during deposition which can be detrimental to the manufacturing process and spread contamination to other wafers (column 1, rows 29-36; column 4, rows 47-51).

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It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to have provided a backside gas able to act like a cleaning gas in the Selbrede and Hayakawa et al. to remove edge coating detrimental to the manufacturing process and capable of spreading contamination to other wafers as taught by Bunkofske.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Selbrede and Hayakawa et al. as applied to claims 1-4, 6, 8-14 above, and further in view of U.S. Patent No. 5,551,982 to Anderson et al.

9. Selbrede and Hayakawa et al. disclose a film deposition apparatus as described above.

However, Selbrede and Hayakawa et al. fail to disclose a backside gas constituted of the same gas as part of gas components constituting the process gas.

Anderson et al. teach the use of a backside gas constituted of the same gas as part of gas components constituting the process gas (column 8, rows 17-34) for the purpose of counteracting the dilution effect the backside gas may have on the process gas, especially at the peripheral portion of the target object, where the dilution effect may result in a non-uniform deposition across the surface of the wafer.

It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a backside gas constituted of the same gas as part of gas components constituting the process gas in Selbrede and Hayakawa et al. for the purpose of counteracting the dilution effect the backside gas may have on the process gas as taught by Anderson et al.

Response to Arguments

10. Applicant's arguments filed 7/3/02 have been fully considered but they are not persuasive, for reasons discussed below. Although new rejections have been made to account for amendments to the claims, the arguments are addressed because Examiner believes some of the arguments are relevant to the new rejections, as well.

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11. A new prior art reference (Hayakawa et al.) has been used to teach a secondary heater arranged opposite the clamp, for heating the clamp. Specifically, Hayakawa et al. was used for its teaching of a clamp opposite the heater. Little weight has been given to the intended use limitation which now reads "for heating the clamp", rather than "for indirectly heating the clamp". The courts have ruled that that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Additionally, as stated above, any heating apparatus in the vicinity of the substrate will necessarily heat all other structures in the vicinity of the substrate, unless insulated.

12. With respect to the argument that the references cited in the previous office action do not disclose or suggest a gas flow path between the clamp and the second heating apparatus when the clamp is moved to a position where the clamp clamps the target object, when Selbrede et al. and Hayakawa et al. are combined, the gas flow path of Selbrede et al., which is located directly beneath the substrate within the susceptor, would be positioned vertically between the clamp and the second heater of Hayakawa et al. Selbrede et al. teach the use of a clamp and a gas flow path (as described above) where the gas flow path is provided for heat transfer and maintaining a temperature within the vicinity of the substrate. Hayakawa et al. teach heating a clamp for the same reason. Motivation for combination of the two prior art references is drawn from the fact that they are both concerned with the same problem-- enhanced temperature uniformity and prevention of unwanted deposition.

Information Disclosure Statement

References cited on the related PCT search report (PCT JP00/00173) have been considered. The references are listed below:

JP 02-228035

JP 09-260469

JP 09-036088

JP 09-115993

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US 5,494,494

US 5,997,651

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km
September 19, 2002


GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700